

BENCHMARKS

VOLUME 5 NUMBER 11 NORTH TEXAS STATE UNIVERSITY DECEMBER 1984

*BENCHMARKS was produced using WordstarTM

TABLE OF CONTENTS

NEW POLICIES, PROCEDURES, AND OTHER IMPORTANT STUFF

	PAGE
Semester Break Hours	1
Get Out Your Red Pens and Make Some Changes...	1
Expanded Calls to Local Area Network	2
SURF Messages Now Available From MVS Batch Jobs.	2
Purge Those Files!	2
What to do in the Event of Computer or Network Problems.	4
Announcing the Computing Center Open House	4
The HP 2680A Laser Printer at NTSU	5
132 Column Output on Televideo 970s and MIME 740s.	6
Accessing the IMSL Library	7
Academic Computing Services Organization Chart	8
The Survey is Going to Be Here Soon.	8

OPERATIONS

NAS/8040 Performance Statistics for November	9
--	---

TECHNICAL SUPPORT

Program Hit Parade	10
------------------------------	----

COMMUNICATIONS

Dialing Up NTSU Over the Telephone	11
--	----

VAXEN

Going Places With VAX/VMS.	13
------------------------------------	----

INFORMATION SYSTEMS

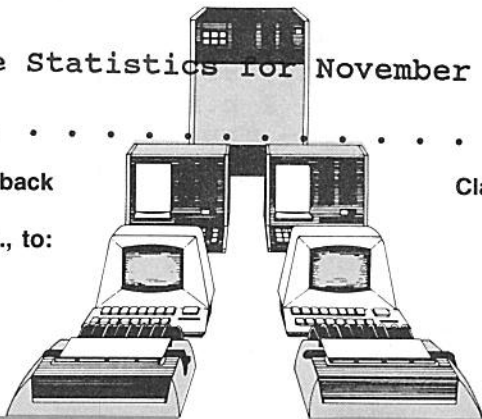
NAS/6650 Performance Statistics for November	21
--	----

A TEXAS CHRISTMAS	22
-----------------------------	----

BENCHMARKS Reader/User feedback is encouraged.

Send all letters, suggestions, etc., to:
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Services Available to Users of the NTSU Computing Facilities

The NTSU Computing Center is located in the Information Sciences Building, Room 119. Telephone: (817) 565-2324. HELP DESK phone: 565-4050.

INFORMATION AND ID CODES - Carolyn Goodman

BENCHMARKS QUESTIONS/CONTRIBUTIONS, ETC. - Claudia Lynch

STATISTICAL/RESEARCH SUPPORT - George Morrow, Scott Barber,
Claudia Lynch, Dave Molta, Panu Sittiwong

STUDENT PROGRAMMING PROBLEMS - CSCI Department, Room 542A, GAB
BCIS Department, Room 152, BA

JCL PROBLEMS - Help Desk

PRE-RESEARCH COUNSELING - George Morrow, Scott Barber, Dave Molta,
Panu Sittiwong, Claudia Lynch

DATA ENTRY & KEYPUNCH - Betty Grise

TEST SCORING & ANALYSIS - Betty Grise

DISK SPACE PROBLEMS - Carolyn Goodman

PASSWORD AND OPERATING SYSTEM PROBLEMS - Help Desk

ADMINISTRATIVE APPLICATIONS - Coy Hoggard

COMMUNICATION/TERMINAL PROBLEMS - Help Desk

PRINTOUT RETRIEVAL - RJE Operators

Fall Computing Hours

Computing facilities will be open during the following hours throughout the Fall Semester (not applicable to holidays):

Computing Center RJE:	7 a.m. Monday - Midnight Saturday Sunday, Noon - Midnight
ISB 110 Terminal Area:	Monday - Thursday, 7:30 a.m. - Midnight Friday, 7:30 a.m. - 6 p.m. Saturday, 9:00 a.m. - 7 p.m. Sunday, 2 p.m. - 10 p.m.
College of Business:	Monday - Thursday, 8:15 - Midnight Friday, 8:15 - 8 p.m. Saturday, Sunday, 12:15 p.m. - Midnight
Room 550C, GAB:	Saturday, 10 a.m. - 8 p.m. Sunday, 2 p.m. - 10 p.m. Monday, Tuesday, 8 a.m. - 8 p.m. Wednesday, 8 a.m. - 5 p.m.

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*   P R O C E D U R E S ,
*   A N D   O T H E R
*   I M P O R T A N T
*   S T U F F
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Semester Break Hours

The following hours will be in effect during the semester break:

Computing Center RJE: OPEN Dec. 20 - 22, 8 a.m. - Midnight
 CLOSED - Dec. 23-25
 OPEN Dec. 26 - 29, 8 a.m. - 5 p.m.
 CLOSED Dec. 30 - Jan. 1
 OPEN Jan. 2 - 5, 8 a.m. - Midnight
 CLOSED Jan. 6
 OPEN Jan. 7 - 12, 8 a.m. - Midnight
 CLOSED Jan. 13
 OPEN Jan. 14, 7 a.m. - RESUME NORMAL HOURS

ISB 110 Terminal Area: OPEN Dec. 20, 21 8 a.m. - 5 p.m.
 CLOSED Dec. 22 - Dec. 25
 OPEN Dec. 26 - Dec. 28, 1 p.m. - 5 p.m.
 CLOSED Dec. 29 - Jan 1
 OPEN Jan. 2 - Jan. 4, 8 a.m. - 5 p.m.
 CLOSED Jan. 5, 6
 OPEN Jan. 7 - Jan. 11 8 a.m. - 5 p.m.
 CLOSED Jan. 12
 OPEN Jan. 13 - RESUME NORMAL HOURS

College of Business: CLOSE - Wednesday, Dec. 19 at 4 p.m.
 REOPEN - Monday, Jan. 14 at 8 a.m. - RESUME
 NORMAL HOURS

Room 550C, GAB: CLOSE - Wednesday, Dec. 20 at 5 p.m.
 REOPEN - Monday, Jan. 14 at 8 a.m. - RESUME
 NORMAL HOURS

Get Out Your Red Pens and Make Some Changes ...

There were some minor errors in the November BENCHMARKS that need to be corrected, so locate your copy and start making the corrections as indicated below:

Page 10 -- Mr. Cengiz Capan and Dr. Chad Nestman are both from what is currently called Business Computer Information Systems (BCIS).

Page 13 -- VM/SP2 should be VM/SP3.

Equipment List -- The AS/8040 has 12 megabytes of main memory.
The AS/6650 has been here since last year.
We have a PDP 11/24 computer with 1/4 megabyte
of main memory and 2 RK07 Disk Storage Units in
the VAX Computer Room.

Software List -- Change BMDP to 1983 Version.
Change VM/SP to Release 3.1
Maintenance on MINITAB is not supported on
MUSIC.
Maintenance and Consultation are fully
supported on MINITAB on the VAXs, and the
version of MINITAB there is 1983.
MACSYMA support should be N P N on the VAXs.

Expanded Calls to Local Area Network

Due to differences in various versions of SYTEK software, it is possible to get a response of NO RESPONSE FROM UNIT or REMOTE PORTS BUSY when making calls to 8040 or 3270 when, in fact, there are still ports available. To exhaust all the possibilities, it is advisable to issue a call to 8050 and/or 8060 if 8040 is unavailable, and 3280 if 3270 is unavailable.

SURF Messages Now Available From MVS Batch Jobs

It is now possible to send a SURF (Special User Request Facility) message from an MVS batch job. The purpose of SURF is to create the equivalent of a Special Handling Card for the operators, stating whatever special instructions you have for your job. Some instances which would warrant a SURF are: Processing two or more tapes during one job; processing a foreign (non-TMS) tape; requesting special forms (like mailing labels); having a job that requires more system resources than normal (i.e. time + lines >= 45, or REGION= more than 650K - must be cleared with Academic Computing first). PLEASE DO NOT USE THIS TO SEND PERSONAL MESSAGES TO THE OPERATOR. The following JCL and parameters are necessary to perform this feat.

To Use SURF From an MVS Batch Job:

```
// EXEC SURF
//C00111 DD *
```

SURF CONTROL CARDS HERE (SEE BELOW)

/*

SURF Control Cards:

Comments can be included by leaving columns 1-5 blank. From one to five 'DEST=' cards can be included. The resulting message will be sent to each destination included.

JOB = / JOB name (8 character maximum)
 USER= / User identification (same as name on Job card)
 DEST=1/ CODE FOR DESTINATION = Administrative machine operator console
 DEST=2/ CODE FOR DESTINATION = Academic machine operator console
 DEST=3/ CODE FOR DESTINATION = Tape operator console
 DEST=4/ CODE FOR DESTINATION = I/O operator console (5TH FLOOR GAB)
 DEST=5/ CODE FOR DESTINATION = I/O operator console (ISB)
 ENTR= / Library to enter (30 CHAR MAX)
 HOLD= / Indicates the job referenced in JOB = is on HOLD - Use REM1-REM7 to indicate why.
 NGHT= / Indicates overnight run - Use REM1-REM7 to indicate why
 TNME= / DSNAME of foreign tape (30 CHAR MAX)
 TVOL= / VOLUMN SERIAL of foreign tape
 FORM= / FORM ID for special form - Use REM1-REM7 to explain to operator.
 PNCH= / Indicates punched output
 REM1=.....
 REM2=.....
 REM3=.....
 REM4=.....
 REM5=.....
 REM6=.....
 REM7=.....

Purge Those Files!

It's that time of year again, so before you leave campus for the holidays, please purge or otherwise remove all unneeded datasets on the academic disk packs (ACAD00, ACAD01, ACAD02). In case you have forgotten the names of some of your datasets, you can use the MAPDISK utility while logged-on to MUSIC. Simply type MAPDISK, and follow the instructions, to get a list of the datasets on a given volume under your ID-code. IT IS PARTICULARLY IMPORTANT THAT INSTRUCTORS PURGE DATA FILES GENERATED BY THEIR CLASSES. Assistance in this task may be obtained by calling Academic Computer Services (2324). Here are some JOB setups to help you in managing your disk datasets.

To delete data sets:

```

//IDIDname JOB (IDID,:05,1),'your name',PASSWORD=yourpassword
// EXEC PGM=IEFBR14
//DD1 DD DSN=USER.IDID.data.set.name,VOL=SER=ACADnn,
        UNIT=SYSDA,DISP=(OLD,DELETE)
//DD2 DD ....dataset information....
//DD3 DD ....dataset information....
//DDn DD ....dataset information....
  
```

If your dataset is catalogued, simply leave off the VOL=SER= portion of the DD statement and it will be uncatalogued and deleted at the same time.

To copy a disk file to tape:

```
//IDIDname JOB (IDID,:05,1),'your name',CLASS=B,PASSWORD=yourpassword
// EXEC PGM=IEBGENER,REGION=256K
//SYSPRINT DD SYSOUT=A
//SYSIN DD DUMMY
//SYSUT2 DD UNIT=TAPE9,DISP=(NEW,KEEP),
//          DSN=data.set.name,LABEL=(n,SL),
//          DCB=(dcb information)
//SYSUT1 DD DSN=USER.IDID.data.set.name,VOL=SER=ACADnn,
//          UNIT=SYSDA,DISP=(OLD,KEEP)
```

Once you are satisfied your file is safely on tape, you should run the IEFBR14 job, described above, to delete your disk dataset. For more information about the Tape Management System, consult HELP OPER while logged on to MUSIC or contact Academic Computing Services.

If you are retaining some datasets on disk, don't forget the naming convention for disk datasets is: USER.IDnn.filename

where: USER. - must appear
 IDnn - is your User ID and must appear
 . - must appear
 filename - is one or more optional fields (each of
 which may not exceed 8 characters)
 separated by periods.

If you do not comply with this convention, your dataset(s) will be deleted from the disk(s) without warning.

What to do in the Event of Computer or Network Problems

When an outage is identified on any system (6650, 8040, or the VAXen), an appropriate message is posted on the System Status Monitor (SSM). The receptionists in the Computing Center Reception Area (ISB 119) are also notified of the problem and are given an estimate of the time the system(s) will be down. If the VAXen, the 8040, or operating systems on the 8040 are involved, the Help Desk is also notified. If you have any questions about the status of a system or systems during an outage, the appropriate procedure is to call the Computing Center at 2324.

Announcing the Computing Center Open House

The NTSU Computing Center will be hosting their Open House for the Spring semester on Wednesday January 30, from 9:00 am until 7:00 pm. The purpose of our Open House is to provide a chance for users to tour the Computing Center facilities. Reservations should be made by calling or stopping by the Computing Center main office in room 119 of the Information Sciences Building (ph. 565-2324).

DECEMBER, 1984

This is a great opportunity for faculty members to bring classes to tour the facilities. Staff members and student groups are also welcome. Tours will not be offered at any other time during the semester. The maximum group size for a tour is 15 people, so large classes should split up and make reservations for several consecutive tours.

The total tour is about 25 minutes long. Tours will be offered at 20 minute intervals. You will begin in the ISB output area where the laser printer and other output devices are located. The tour then moves to the fifth floor of the GAB where you will view the mainframe machine room and VAX machine room.

We invite you to take advantage of this opportunity to view the computing facilities at NTSU.

The HP 2680A Laser Printer at NTSU
By Lynne Adkins, I/O Operations Supervisor

The Hewlett-Packard 2680A Laser Printer provides high quality computer-generated output with the flexibility of different character styles (fonts) and various character per inch settings. This printer serves users from both the 6650 and 8040 mainframe computers, resulting in an average of over 5.5 million lines printed each week. The average number of lines per week for any one of the other 8 printers serving either Administrative or Academic users is about 500,000 lines - less than one tenth as much as the Laser.

If you use the Laser printer often, or intend to begin using it, read the guidelines below. If you remember these when you use the Laser, it will benefit you - and in turn, all others who use the printer.

One important fact is that the HP 2680A Laser Printer should not be viewed as a "Fast Turnaround" printer. It does print at a speed of approximately 3,000 lines per minute - 3 times faster than most of our impact printers. However, printing speed is not the only factor which affects turnaround time.

For example, when an user on MUSIC routes his output to the Laser, the output is sent from the 8040 disk drive on which it was stored, through a communication line, to a disk drive on the HP 3000 system. After this occurs, the user will receive the response "JOB NOT FOUND" when he checks OSJR for job status.

Once the user's job has been written to the HP 3000 disk, it must wait to print on the Laser. Jobs are printed on the Laser in the order received by the HP system. The waiting period at this point may be from approximately 30 minutes (at times of VERY low user activity), to 2 hours (medium activity), up to 4 or more hours (at times of peak usage - class assignments due, end-of-semester rush, etc.). For this reason allow plenty of lead time when you want to use the Laser printer for output.

- OTHER DO'S and DON'TS - DO use Remote 3 or Remote 1 for faster turnaround on printed output.
- DO allow enough waiting time before you go to the ISB to pick up your Laser output - 45 minutes at the least ... when it's the last month of the semester, one to two hours (or more) is a safer bet.
 - DON'T request multiple copies (maximum of 4 allowed) until you're SURE you have all the "bugs" out of your file.
 - DON'T resubmit your job several times in hopes of getting one of the copies out, when turnaround is slow - you make it slower for yourself and everyone else.

132 Column Output on Televideo 970s and Mime 740s
By Dave Molta, Academic Computing Services Staff

A common problem experienced by many users involves the "wrap-around" of 132-column output on 80-column computer terminals. This phenomenon makes output difficult, if not impossible, to interpret, and it is particularly bothersome to users of statistical programs such as SAS and SPSS-X when column headings and other descriptors merge with data output.

One solution for SAS and SPSS-X users is to specify an output width of 80 columns from within their jobs. In the case of SPSS-X, the command SET WIDTH=80 will produce 80-column output when placed at the beginning of your job. With SAS, the command OPTIONS LINESIZE=80; will achieve similar results when placed at the beginning of your job. Note, however, that some procedures within these two packages will still override this command. The logical alternative to this is to maintain 132-column output and reconfigure the terminal to display all 132 columns.

The newest terminals installed on campus, Televideo 970s and Micro-Term Mime 740s, can be configured for 132-column output through a series of relatively simple steps. (NOTE: Older Mime 2As, such as those found in the business building, do not have this capability.) To produce 132-column output, follow the steps outlined below.

MIME 740

1. Access MUSIC by calling 8040 and specifying LA36 as the terminal type (/ID XXYY;LA36 where XXYY is your MUSIC ID). NOTE: The 3270 protocol converter does not support 132-column output.
2. While in *GO mode, press the SET UP key in the upper left corner of the keyboard.

3. Press the number 9 with 80/132 printed above it. This toggles you into 132-column mode.
4. Press the SET UP key and the <RETURN> key to re-enter terminal mode. The terminal is now configured for 132-column output.
5. When you have finished using the terminal, press SET UP, 9, and SET UP to reconfigure the terminal to normal 80-column operation.

Televideo 970

1. Access MUSIC by calling 8040 and specifying LA36 as the terminal type (/ID XXYY;LA36 where XXYY is your MUSIC ID). NOTE: The 3270 protocol converter does not support 132-column output.
2. While in *GO mode, press the SET UP key in the upper right corner of the keyboard while simultaneously pressing the SHIFT key.
3. Press the right arrow cursor twice and press the letter "T" to toggle into 132-column mode.
4. Press the SET UP key while simultaneously pressing the SHIFT key to re-enter terminal mode. The terminal is now configured for 132-column output.
5. When you have finished using the terminal, press the RESET key while simultaneously holding down the CTRL key to return the terminal to 80-column mode.

Note that by entering LA36 as the terminal type, MUSIC assumes you are working at a hard-copy terminal. Therefore, output will not pause every 24 lines as it does when VT100 is specified as the terminal type. To prevent output from scrolling off the screen before you have read it, type CTRL-S (depress the CTRL key and the S key simultaneously). To resume scrolling, type CTRL-Q.

Alternatively, you may enter the command /PAUSE immediately after signing on. This will cause the output to pause and wait for you to strike the <RETURN> key after a number of lines have been displayed. Note, however, that the actual number of lines between "pauses" may be inconsistent. Should this present problems, use the CTRL sequences outlined above. If you have any trouble with these procedures, contact the Computing Center for assistance.

Accessing the IMSL Library

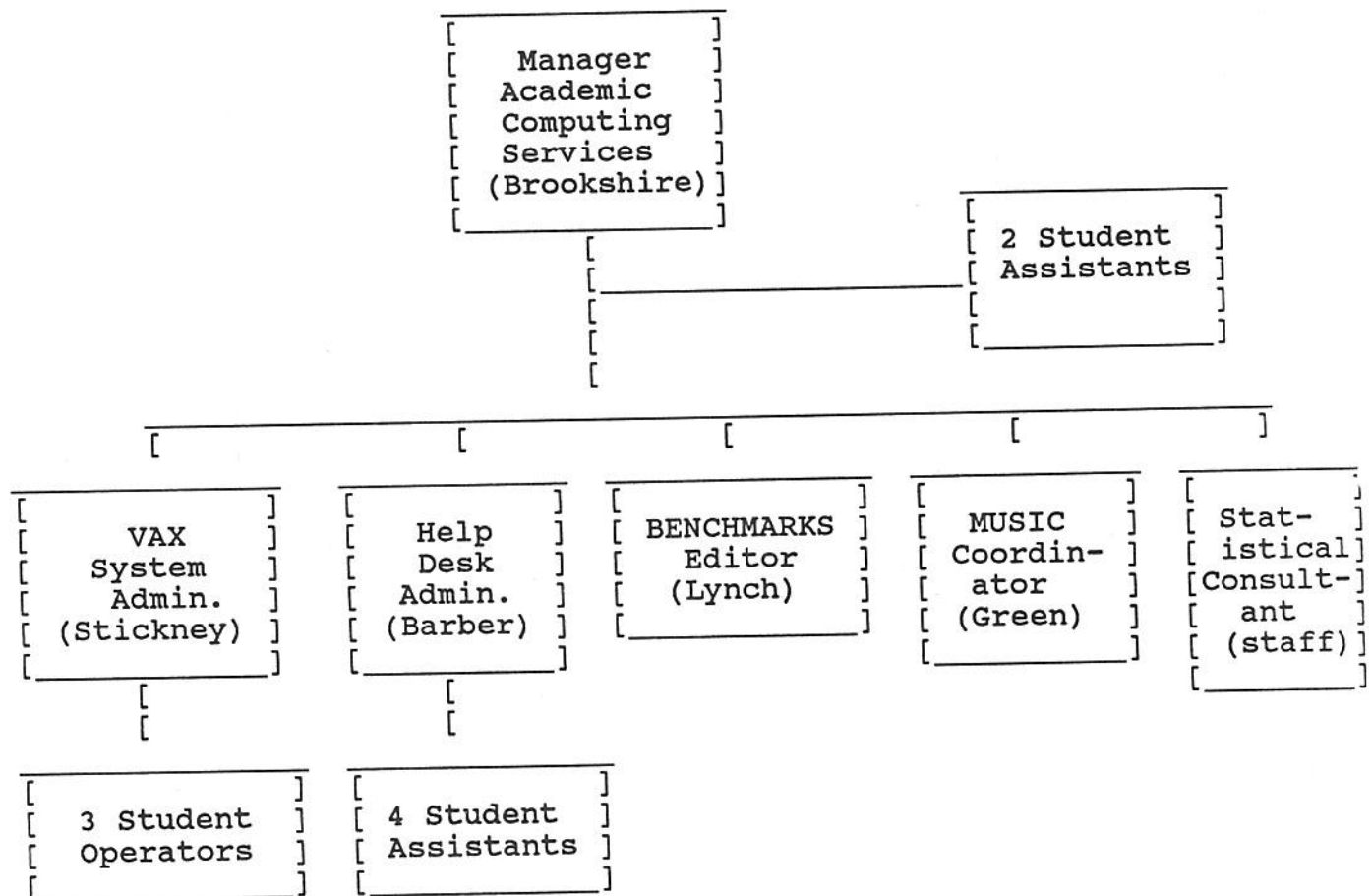
The IMSL library is a comprehensive set of over 540 mathematical and statistical FORTRAN subroutines that can be utilized in the development of FORTRAN applications programs. Manuals for the IMSL library are available in the Science and Technology Library

(ISB) on microfiche.

The following SYSLIB cards enable the FORTRAN compilation to include the IMSL routines and must be inserted in your jobstep that executes FORGCLG:

```
//LKED.SYSLIB DD DSN=SYS1.FORTLIB,DISP=SHR
//              DD DSN=RSRCH.D0683.IMSL.E91.DPLIB,UNIT=SYSDA,DISP=SHR
```

Academic Computing Services Organization Chart - December, 1984



The Survey is Going to Be Here Soon

Don't forget to be on the lookout for the Computing Center survey. It will be out early next semester.

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*   O P E R A T I O N S   *
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Backup Schedule for OS/MVS

OS/MVS disk packs (academic and administrative) are backed up daily, Tuesday through Saturday, from 4-6:30 a.m., and Sunday from Midnight to 3 a.m. A backup of all the operating systems and their contents is done once every two weeks at some low activity period over a weekend.

NAS/8040 Performance Statistics for November

SYSTEM	SCHEDULED OPERATING HOURS	PLANNED MAINT. HOURS	PLANNED PRODUCTION HOURS	UNPLANNED MAINT. HOURS	PRODUCTION HOURS ACHIEVED	SYSTEM UPTIME
VM/SP3	720	14.90	705.10	3.26	701.84	99.5%
MUSIC	720	37.33	682.67	12.38	670.29	98.2%
MVS/JES2	720	15.25	704.75	9.19	695.56	98.7%
COMPLETEA	720	15.46	704.54	11.17	693.37	98.4%

CPU availability equals approximately 100% uptime.
 $\text{System Uptime} = (\text{Production Hrs Achieved}) / (\text{Planned Production Hrs})$
 $\text{Production Hrs Achieved} = (\text{Planned Production}) - (\text{Unplanned Maint.})$
 $\text{Scheduled Operating Hrs} = (\text{Planned Maint.}) + (\text{Planned Production})$
 MUSIC Planned Maintenance Hours include 22.10 hrs system backup.

Lost productivity is calculated as the greatest amount of elapsed time that any one of the production systems was unavailable for scheduled operation. Lost productivity hours were contributed to by the following key causes:

CPU, Tape, and Disk Subsystems (NAS)

1. 7350 DASD Failure	0.33 HOURS
2. Field Change Order Installation	15.52

TOTAL	15.85 HOURS

Terminal Control Systems (IBM)

1. 3272 TCU Failures	8.90 HOURS

Miscellaneous

1. Undetermined Causes for Systems Restarts	1.50 HOURS
2. VM/SP3 System Tuning/Improvements	1.90
3. MUSIC System Tuning/Improvements	2.31

TOTAL	5.71 HOURS

 GRAND TOTAL 30.46 HOURS

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*   T E C H N I C A L   *
*   S U P P O R T       *
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Program Hit Parade

By Dan Hood, Technical Support

The following programs were used the most frequently during the past two months.

TOP TEN PROGRAMS IN TERMS OF FREQUENCY OF RUNS: OCTOBER

<u>Program</u>	<u>Description</u>	<u>Number of Runs</u>
1. IEWL,HEWL	Linkage Editor	21641
2. IKFCBL00	VS COBOL Compiler	10516
3. IEBGENER	IBM Utility	7621
4. IEUASM, IFOX00	System Assembler	6826
5. SCRIPT	Waterloo Script	6600
6. PTPCH	Dataset Lister	4531
7. SASLPA	SAS	4125
8. IEFBR14	IBM Null Utility	2470
9. LOADER	System Loader	2176
10. SPSS	SPSS-X	1878

TOP TEN PROGRAMS IN TERMS OF FREQUENCY OF RUNS: NOVEMBER

<u>Program</u>	<u>Description</u>	<u>Number of Runs</u>
1. IEWL,HEWL	Linkage Editor	20890
2. IEUASM, IFOX00	System Assembler	18147
3. IEBGENER	IBM Utility	11721
4. IKFCBL00	VS COBOL Compiler	11367
5. SCRIPT	Waterloo Script	8714
6. IEFBR14	IBM Null Utility	7264
7. SASLPA	SAS	7859
8. PTPCH	Dataset Lister	7264
9. FASTLOAD	Model204 Utility	3512
10. IEBPTPCH	IBM List Utility	3132

TOP TEN PROGRAMS IN TERMS OF CPU SECONDS USED: OCTOBER

<u>Program</u>	<u>Description</u>	<u>CPU Seconds</u>
1. IEUASM, IFOX00	System Assembler	43640
2. SASLPA	SAS	27874
3. IKFCBL00	VS COBOL Compiler	19433
4. PTPCH	Dataset Lister	10497
5. SPSS	SPSS-X	10147
6. BATCH204	Batch Database	7852
7. SCRIPT	Waterloo Script	7219
8. IEL0AA	PL/I Optimizer	6189
9. IEBGENER	IBM Utility	2883
10. LOADER	System Loader	2632

TOP TEN PROGRAMS IN TERMS OF CPU SECONDS USED: NOVEMBER

Program	Description	CPU Seconds
1. SASLPA	SAS	64189
2. IEUASM, IFOX00	System Assembler	50781
3. IKFCBLOO	VS COBOL Compiler	20506
4. SPSS	SPSS-X	11994
5. SCRIPT	Waterloo Script	11237
6. IEWL, HEWL	Linkage Editor	8849
7. PTPCH	Dataset Lister	7501
8. FASTLOAD	MODEL204 Utility	4403
9. IEL0AA	PL/I Optimizer	3625
10. IEBGENER	IBM Utility	3271

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*   C O M M U N I C A T I O N S   *
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Dialing Up NTSU Computers Over the Telephone

Phone numbers for the local area network are:

300/1200 BAUD: (817) 565 - 3300
 3499

300 BAUD: D/FW METRO 429 - 6006

The numbers that will accept either 300 or 1200 baud communications have an autobaud feature that requires the user to hit the <RETURN> key repeatedly until the receiving modem can determine the appropriate baud rate. The METRO telephone number is for 300 baud communications only. After a communications link has been successfully established, the user will receive the # prompt. At this point, it will be necessary to issue the appropriate CALL command to connect with a computer.

CALL 8040 will connect with the 8040
8050 (on which you can access MUSIC)
8060

CALL 8300 will connect with the 8040 at 300 baud

CALL 3270 will connect with the 8040 through the 3270
3280 protocol converter

CALL A780 will connect with VAX system A
CALL B780 will connect with VAX system B

CALL 2000 will connect with the HP-2000 computer


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*  M U S I C  *
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MUSIC Backup Hours

A message will be sent to all users signed on to MUSIC approximately 10 minutes before backups are begun. It will be in the form * * MUSIC SHUT DOWN AT xxxx AM - SCHEDULED BACKUP **. To find out the backup hours while signed on to MUSIC, enter HELP HOURS. The following backup schedule is currently in effect:

Tuesday	3 a.m. (for about 3 hours)	Weekly backup
Wednesday - Saturday	4 a.m. (for about 2 hours)	Daily backup
Saturday	Midnight (for about 2 hours)	Daily backup

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* * * * *
*           *
*  V A X E N  *
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VAX Backup Schedule

Incremental backups of both VAX systems are performed Monday through Thursday at 5 p.m. Any files that have been created or changed are backed up. Users do not have to log out, but any files that are open at the time of the backup will NOT be backed up.

Full backups of both systems are done every Friday at 5 p.m. Again, users do not have to log out, but any files that are open will NOT be backed up.

A "stand alone" backup of both systems is done on the last working day of the month. During this time, all system software, as well as user files, are backed up. The systems must be taken down for this backup, which will usually not last more than 1/2 hour. All users that are logged on will be warned of the impending backup, and must log out.

NOTE: No backups are taken on the weekends. Requests for restoration of files should be made via MAIL to the username OPERATOR.

Going Places With VAX/VMS

By K. Stickney, Vax System Manager
(With contributions by Steve Pettit)

Part I: DCL, MCR and UNIX

This is the first in a three-part series in which various operational environments are described which either exist under, or are reachable from, the VMS operating system running on two VAX-11/780 computers at North Texas State University. Part I will describe command line interpreters and operating system emulators available under VMS. Part II will discuss communicating with the HP3000 to get laser printer output. Part III will explain communication with MVS on the AS/8040 IBM-compatible mainframe. The reader is assumed to have some knowledge of both VMS and UNIX, and is encouraged to consult the documentation available in the public terminal areas for reference when necessary.

VMS (Virtual Memory System) is a multi-tasking multi-user executive. The kernel of VMS was carefully engineered in parallel with the VAX hardware architecture with the intent of providing a closely tailored operating system. As normally supplied, the VMS kernel is not intended to be modified by the user. However, it is written in such a way that considerable flexibility and modifications are possible in the way one communicates with the low-level services provided by the kernel. One such mechanism is the Ancillary Control Processor, or ACP, a piece of software which behaves in a known way with regard to a particular device. Existing examples are the disk ACP, the magtape ACP, and the DECNET ACP (the latter not implemented at NTSU). An ACP is a higher level piece of software than a device driver. Another major user communication facility provided for under VMS is the Command Line Interpreter, or CLI. There are two standard CLIs supplied with version 3 of VMS, namely DCL and MCR. The default CLI is DCL, which greets you with a dollar-sign when it is ready to accept a command. MCR simulates the environment of a PDP-11 16-bit computer running the RSX-11M operating system, from which VMS is derived. It is possible to enter the MCR command line interpreter by typing 'MCR' after logging on in the usual manner. This invokes the alternate CLI from DCL and results in a 'MCR>' prompt. To get back to DCL, hold down the 'CTRL' key and press the letter 'Z' (control-Z). It is not likely that you would have much use for MCR unless you were engaged in cross-software development for PDP-11 systems running RSX-11M (such as the Physics Department has). It is also possible to log directly into MCR as follows:

Username: ZQ01/CLI=MCR
Password:

This would result in the user ZQ01 being eventually greeted by the native MCR prompt '>' rather than the usual '\$' of DCL. If you try this, you will first be greeted with a barrage of error messages from MCR as it tries to execute DCL commands in the system login file. This approach is not recommended.

Command Line Interpreters are the most efficient way of providing a user interface to VMS. A less efficient but still useful way is to write software which emulates another operating system such as UNIX. At NTSU the Eunice package is currently in use to provide a simulated but reasonably complete UNIX environment from DCL. Eunice uses a lot of DCL symbolic and logical definitions to simulate UNIX, and as such is a layer on top of DCL and VMS, rather than a CLI. It is interesting to note that DEC recently announced a UNIX-like CLI for VMS called DEC/Shell, so it is now possible to acquire a UNIX CLI which runs at the same level as DCL, increasing efficiency and speed of execution considerably. Version 3.2 of Eunice, which we are running at NTSU, is slower than a true CLI (or native UNIX), of course, but nonetheless offers capabilities quite valuable for UNIX instruction and software development. The remainder of this article will go into details of the Eunice implementation of UNIX.

STARTING UP UNIX UNDER VMS

The command UNIX is all that is necessary to start up the Eunice UNIX emulator. A short message will be displayed, after which you will see a prompt. UNIX expects a number of 'invisible' initialization files to be present in your root (top-level) directory, and if these files do not yet exist, you will get a '%' prompt which indicates that the 'Bourne Shell', a UNIX command line interpreter, is waiting for your next command. Eunice is oriented toward the use of the "other" standard UNIX shell, the 'C Shell'. All UNIX commands are programs. The Bourne Shell is the program "sh", while the C Shell is the program "csh".

NOTE: UNIX normally takes lowercase letters. It is case-sensitive; for example, the command 'printenv' is entirely different from 'PRINTENV' or 'Printenv' or 'PrintEnv'. Each of the previous four commands would be completely different to UNIX. Once you enter Eunice all normal commands MUST be specified with lowercase or the error message ":Command not found" will be displayed.

To properly set up your environment so that the C Shell will be invoked the next time you start up UNIX, files named '.login' and '.cshrc' must exist in your root directory. These filenames, since they begin with a dot, are not normal VMS filenames and hence will not look like you might expect when you get back to VMS. They are encoded as "hash files" so that the UNIX names will be accommodated under Eunice; from VMS they look like garbage filenames with lots of H's in them, such as HSH0AJLLA.HSH and the like. Unknowing users have been known to delete these "mystery files", then wonder where they went when in UNIX, not realizing the filenames are encoded under VMS with this hash file technique.

TO COPY .login AND .cshrc FILES TO YOUR DIRECTORY:

STEP 1:

From VMS type UNIX which will call Eunice. The "\$" is the VMS prompt.

\$ UNIX

After the Eunice login messages the '%' prompt appears. The user has now entered Eunice and is ready to copy the files .login and

STEP 2:

The Eunice file copy command is "cp" from_file to_file.

```
% cp /usr/skel/.login .login
```

```
% cp /usr/skel/.cshrc .cshrc
```

After issuing both of these commands the files will now be located in the user's main directory, although they are "invisible." These files contain the necessary elements used to modify the Eunice operating environment (A more thorough description of these files is available at the end of this section).

The prefixing "." denotes that the file will not be listed with the normal directory command "ls" and is thus considered "invisible". The user may wish to verify their existence by typing "ls -a". The option -a will list all of the files in the user's current directory. Both .login and .cshrc should now be present. If they are not listed as being present type "ls .login" repeat the first two steps. If the user is certain that the commands were typed in correctly and the files are still not present then a VAX operator should be called for assistance.

To log out, type with control-d. The next time the user logs into Eunice these files will execute and initialize the environment accordingly. The UNIX logout command is now 'logout' rather than control-d.

TO MODIFY .login AND .cshrc INITIALIZATION FILES:

Alterations of the files may be made with any of the editors that are provided through Eunice (ed, ex, or vi) or from VMS if steps are taken to temporarily rename these files to VMS-compatible filenames. This can be done with the "mv" command, changing the names to, say, login.txt and cshrc.txt for editing under VMS. After the files have been copied and modified they need to be renamed as hidden files. This will allow them to be executed when logging into Eunice.

The command to rename files is "mv" from_file to_file.

```
% mv login.txt .login
```

and

```
% mv cshrc.txt .cshrc
```

The files have now become invisible. If the directory command

"ls" is used the files will not be visible. The files are there and can be listed with the file listing commands, but they must be specified with a preceding "." (e.g. % cat .login). Under VMS the files will now appear as several hash files. Do not be confused by the fact that there is often more than one hash file per UNIX file.

At any time a user may rename either or both of the files from hidden to nonhidden. For a file to be edited from VMS it must be a nonhidden file.

DESCRIPTION OF THE EUNICE login AND cshrc FILES

The typical customized .cshrc file might look like this:

```
#
#      a sample .cshrc
set history=20
set cdpath=(/usr/eun /usr/local /usr/man)

alias back      'set back=$old; set old=$cwd; cd $back; unset back; dirs'
alias cd        'set old=$cwd; chdir \!*'
alias edt       'vms @eun_usr:\[usr.eun\]int.com edit/edt'
alias int       'vms @eun_usr:\[usr.eun\]int.com'
alias h         history
alias lo        logout
```

The .login file might look like this:

```
set notify
set path = (. /usr/ucb /bin /usr/bin /usr/eun /usr/local)
setenv PATH ./usr/ucb:/bin:/usr/bin:/usr/eun:/usr/local
set history=20
#
alias h          history
alias lo         logout
#
#      short hand for vms commands
#
alias info 'show users'
alias pu 'vms purge &' # '&' creates a parallel process.
#
#      compiler switches
#
#      # Have cc(1) use UNIX assembler and loader.
alias unixobj 'setenv AS_IMAGE /bin/unixas; setenv LD_IMAGE /bin/unixld'
#      # Have cc(1) use VMS assembler and loader.
alias vmsobj 'setenv AS_IMAGE /bin/vmsas; setenv LD_IMAGE /bin/vmsld'
#
# Do some initializations
#
umask 2          # files created with editors have protection (rw-rw-r--)
unixobj          # cc(1) will use UNIX assembler and loader now.
set prompt=' \!-> '
```


EXPLANATION OF THE FILE CONTENTS

All Eunice commands are in lower case. The "#" sign indicates a comment. Further explanation of the files follow:
 "set" is used to modify the environment and "alias" is used to set an alias for an existing commands. Note that the original command is also still in effect.

```
set cdpath=(/usr/eun /usr/local /usr/man)

set path = (. /usr/ucb /bin /usr/bin /usr/eun /usr/local)

setenv PATH ./usr/ucb:/bin:/usr/bin:/usr/eun:/usr/local
```

The above three commands will set up paths that will be searched to find commands issued. A path corresponds to a VMS directory to be potentially searched in the event that a program corresponding to a UNIX command still needs to be found by the shell. Since all UNIX commands are the names of programs, this provides a means of restricting or expanding the scope of commands available to your login session. Paths containing more frequently-used commands should be listed first, since the shell will stop looking after it has found the command to execute as a result of looking down the specified path(s).

```
set notify
```

Causes the shell to notify the user asynchronously when the status of the current job changes; normally notification is presented before a prompt.

```
set prompt=' \!-> '
```

Establishes the prompt as an event counter and "-> ". Your first prompt would be "1->" to indicate the first event. Each subsequent successful command increments the event counter. The usefulness of having an event counter is primarily for the history mechanism, described next.

```
set history=20
```

Tells Eunice to keep track of the last 20 commands issued. This can be altered to trace back to however many events the user wishes to track. The purpose of this is to allow the user to re-execute a past command. To do this, the user types "history", and a list of the past events are listed along with a number. The user then types "!" followed by the event line number to be re-executed. If the number is omitted, the history command traces back 0 lines. For example,

```
1-> cat foo.txt
2-> grep stuff foo.txt
3-> !1
```


would re-execute command number one.

```
alias info 'show users'
```

Establishes that "info" will execute the VMS command to show who is logged into the system.

```
alias pu 'vms purge &'
```

This similiarly establishes an alias for a VMS command, with the added feature that the UNIX prompt will return for further commands while the PURGE command executes in parallel. This feature of easily invoked multiple parallel processes is part of why the Eunice version of UNIX is rather slow at times.

```
alias unixobj ...
```

"unixobj" will now set the environment so that object files created by Eunice/UNIX compilers are created in the UNIX object code format, the normal default.

```
alias vmsobj ...
```

Changes the environment so that Eunice will create object files that are VMS compatible, useful for linking object files created under Eunice that need to be linked with object files created under VMS. This provides a powerful capability to mix languages, but is not for the faint at heart.

If in doubt about whether "unixobj" or "vmsobj" is in effect, type the command "printenv". This will display the active environment.

```
alias h history
```

Allow the history command be invoked by simply typing the letter "h".

```
alias lo logout
```

Issue logout with "lo".

```
alias back ...
```

This will place a user back to the previous directory that they were in.

```
alias cd ...
```

This acts as a home command, it will return a user to their main directory.

```
alias edt ...
```

This will invoke the VMS EDT editor.

alias int ...

Allows interactive processes to be set up, such as the VMS editor.

GETTING HELP

One can obtain a listing of all the available commands offered by Eunice by typing "man -k -". However, since one may tire very quickly of scanning the entire list for a particular command, Eunice provides three main ways of obtaining help for the availability of a particular command (note: not all of the commands that Eunice thinks it has are available). These are "apropos", "man", and "whatis". Each command is followed by the keyword for look-up (i.e. command keyword). These commands do not provide the same information for each keyword, and each has its appropriate usage.

apropos

"apropos" is used when looking for a particular word that may exist in the descriptions of several commands. For example, to find all the commands that contain the keyword "pascal", type "apropos pascal" and the following will be displayed:

pc (1)	- Pascal compiler
pi (1)	- Pascal interpreter code translator
pix (1)	- Pascal interpreter and executor
px (1)	- Pascal interpreter
pxp (1)	- Pascal execution profiler
pxref (1)	- Pascal cross-reference program

This provides a list of all the compilers, interpreters and utilities that are associated with Pascal.

man

"man" is the documentation manual command for UNIX. Unfortunately this is very inefficient in it's Eunice implementation and is often not practical to use. The inefficiency is a side effect of Eunice running under VMS. "man" has to operate under multiple-level processing created by VMS and it may take anywhere from a few seconds to a few hours for a manual section to be properly formatted for output display if it has never been requested. However, once a manual topic has been formatted, it can be retrieved in a relatively short time. Some manuals such as "mail" have already been built with "man" and may be displayed. Type "man mail" for a demonstration of this facility. Manual sections which have not yet been formatted will be obvious as the message "reformatting page..." will appear. You are usually in for a long wait if this happens.

whatis

"whatis" is a search for the command word. When it is found, the word and a terse description of the command are displayed. For example "whatis apropos" will display:

apropos (1) - locate commands by keyword lookup

When using "man", "apropos", or "whatis", a number enclosed in parentheses will be displayed following the the command word heading. These numbers correspond to the sections of the printed UNIX manual and are interpreted as follows:

1. Commands
 - 1C. of general utility
 - 1G. used primarily for graphics and computer-aided design
2. System Calls
3. Subroutines
4. Special files
5. File formats and conventions
6. Games
7. Macro Packages and language conventions
8. Maintenance commands and procedures

Readers are encouraged to consult the UNIX documentation, either printed or online, to broaden their understanding of the topics introduced in this article.

```

* * * * *
*
*   H P - 2 0 0 0
*
* * * * *

```

HP-2000 Backup Schedule

Routine system backups are scheduled to be performed at the following times:

8 a.m. Monday through Friday for approximately 20 minutes;
 4 p.m. Friday for approximately 1.5 hours.

DECEMBER, 1984

```

* * * * *
*
*   I N F O R M A T I O N
*   S Y S T E M S
*
* * * * *

```

NAS/6650 Performance Statistics for November

SYSTEM	SCHEDULED OPERATING HOURS	PLANNED MAINT. HOURS	PLANNED PRODUCTION HOURS	UNPLANNED MAINT. HOURS	PRODUCTION HOURS ACHIEVED	SYSTEM UPTIME
MVS/JES2	720	0.00	720.00	6.33	713.67	99.1%
COMPLETEA	245	0.00	245.00	1.44	243.56	99.4%
ADABASA	720	12.36	707.64	13.98	693.66	98.0%

CPU availability equals approximately 100% uptime. Please consult the NAS/8040 Performance Summary for an explanation of cell entries. It can be found under the OPERATIONS section of this newsletter.

Lost productivity is calculated as the greatest amount of elapsed time that any one of the production systems was unavailable for scheduled operation. Lost productivity hours were contributed to by the following key causes:

DASD Subsystem (STC)

1. Dual-Porting Failures on 8650 Disk Controllers 4.56 HOURS

Unit Record Equipment (STC)

1. 2944 Channel Extender Failure 0.87 HOURS

Miscellaneous

1. MVS/JES2 System Tuning/Improvements 0.63 HOURS
2. ADABASA Program Tuning/Improvements 6.44

TOTAL 7.27 HOURS

GRAND TOTAL 14.17 HOURS

'Twas the Night Before Christmas In Texas, You Know
Author Unknown

'Twas the night before Christmas in Texas, you know
Way out on the prairie without any snow.

Asleep in their cabin were Buddy and Sue
A-dremin' of Christmas like me and like you.

Not stockings, but boots at the foot of their bed,
For this was in Texas, what more need be said?

When all of a sudden from out the still night
There came such a rukus it gave me a fright.

And I saw 'cross the prairie like a shot of a gun...
A loaded up buckboard come on at a run.

The driver was geeing and hawing with will
The horses not reindeer he drove with such skill.

Come on there Buck, Pancho and Fritz to the right.
There'll be plenty of traveling for you all tonight.

The driver in Levis and a shirt that was red
Had a ten gallon Stetson on top of his head.

As he stepped from his buckboard he was really a sight
With his Levis and Stetson and red shirt so bright.

As he burst in the cabin the children awoke
And both so astonished that neither one spoke.

And he filled up their boots with such presents galore
That neither could think of a single thing more.

And when Buddy recovered the use of his jaws
He asked in a whisper "Are you Santa Claus?"

Am I the real Santa, well what do you think?
And he smiled as he gave a mysterious wink.

Then he leaped in his buckboard and called in his drawl
To the children of Texas, MERRY CHRISTMAS, YOU ALL!

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